



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/800,776 | 03/08/2001 | Junichi Yamanouchi | 003510-081 | 8385 |

21839 7590 06/12/2002

BURNS DOANE SWECKER & MATHIS L L P
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

SHOSHO, CALLIE E

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

1714

DATE MAILED: 06/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/800,776

Applicant(s)

YAMANOUCHI ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 4, 9-11, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 2, line 2 after formula (I) recites an improper Markush group, i.e. "A represents one of $-NR^4R^5$ and a hydroxyl group". It is suggested that "and" in the recited phrase is changed to "or".

Similar suggestions are also made in claim 2, lines 2, 4, 6, 7, 12, and 15 after formula (I), claim 4, lines 2, 5, 7, 20, 22, 23, 27, 29, 33, and 35 after the recited formulae, claim 9, lines 6, 9, and 21 after formula (II), claim 10, line 5 after formula (III), claim 11, lines 7 and 10 after formula (IV), and claim 16, lines 2, 4, 6, 7, 12, and 15 after formula (I).

(b) Claim 4 recites an improper Markush group. In the phrase "at least one hydrophobic high boiling point organic solvent selected from hydrophobic high boiling point organic solvents represented by following formulae S-1 to S-9", it is suggested that "the group consisting of" is inserted after "from" and before "hydrophobic" and that "and" is inserted between the recitation of formula S-8 and formula S-9.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-8, 12-14, and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Yao (U.S. 4,246,154).

Yao discloses ink jet ink and method of ink jet recording wherein the ink comprises coloring compositions which is formed by dispersing coloring particulates in aqueous medium wherein the coloring particulates comprise nonionic vinyl polymer which has particle size of 0.05-0.5 μm , hydrophobic high boiling point organic solvent such as dibutyl phthalate or tricresyl phosphate, and oil-soluble dye (abstract, col.1, lines 6-17 and 42-46, col.2, lines 38-40 and 58-59, col.9, lines 7-10, and col.10, lines 25-30 and 40-55). From example 4, it is calculated that the composition comprises, for instance, 53% solvent, 21% polymer, and 21% dye.

Although there is no disclosure of the specific inductive capacity of the high boiling point solvent, given that the solvents disclosed by Yao are identical to those presently claimed, it is clear that the solvents inherently possess specific inductive capacity as presently claimed.

In light of the above, it is clear that Yao anticipates the present claims.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1714

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

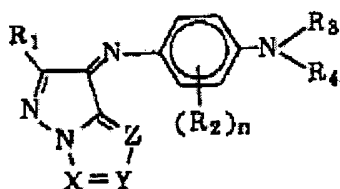
7. Claims 2, 9-10, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of either JP 03231975 or JP 09059552.

The disclosure with respect to Yao in paragraph 4 above is incorporated here by reference.

Art Unit: 1714

The difference between Yao and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

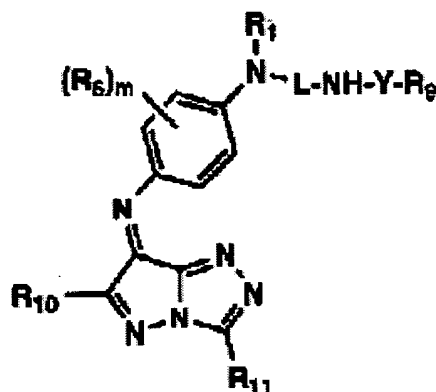
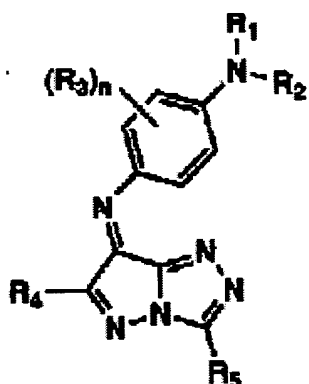
JP 03231975, an English translation of which is included in this office action, is drawn to ink jet ink and discloses an oil-soluble dye of the formula:



wherein R_3 and R_4 , which correspond to presently claimed R^4 and R^5 , are each hydrogen, alkyl, cycloalkyl, aralkyl, or aryl group, R_2 , which corresponds to presently claimed R^2 , R^3 , R^6 , and R^7 are each hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, R_1 , which corresponds to presently claimed R^1 , is hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, presently claimed X^1 and Y are independently either $-CR_5=$ or $-N=$, where R_5 is hydrogen or alkyl, aryl, or heterocyclic, group, and presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ wherein R^6 and R^7 are defined above (abstract, claim 1, page 7, pages 18-25). The motivation for using such dye is to produce a printed image with good hue (page 5, first full paragraph).

Alternatively, JP 09059552, an English translation of which is included in this office action, which is drawn to ink jet ink, disclose the use of oil-soluble dyes of the formula:

Art Unit: 1714



wherein R_1 and R_2 , corresponding to presently claimed R^4 and R^5 , are hydrogen, aliphatic, aromatic, or heterocyclic group, L is alkylene group, Y is carbonyl or sulfonyl group, R_9 is aromatic, aliphatic, heterocyclic, alkoxy, or amino group, R_3 or R_6 , which each correspond to either presently claimed R^2 , R^3 , R^6 , and R^7 are hydrogen, halogen, alkoxy, aryl, carboxyl, or amino group, R_4 or R_{10} , which each correspond to presently claimed R^1 , are aliphatic, aromatic, heterocyclic, alkoxy, sulfonyl, or amino group, presently claimed X^1 is $-CR_5=$ or $-CR_{11}=$, which each correspond to presently claimed $-C(R^8)=$, where R_5 or R_{11} is hydrogen, aliphatic, or aromatic group, presently claimed Y is $-N=$, and presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ wherein R^6 and R^7 are defined above (abstract, claim 1, claim 3, and paragraphs 9, 16, 24-30, and 39-56). The motivation for using such dye in the ink composition is that the dye produces a printed image that has excellent color tone, reproducibility, and resistance to light (paragraph 7).

In light of the motivation for using specific type of oil-soluble dye disclosed by JP03231975 or JP 09059522, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Yao in order to produce an ink with good hue, or

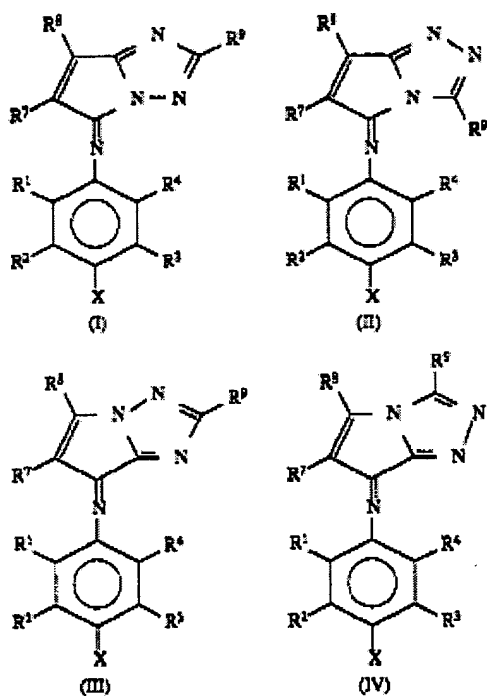
alternatively, excellent color tone, reproducibility, and resistance to light, and thereby arrive at the claimed invention.

8. Claims 2 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of Suzuki et al. (U.S. 5,508,421).

The disclosure with respect to Yao in paragraph 4 above is incorporated here by reference.

The difference between Yao and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

Suzuki et al. disclose the use of oil-soluble dyes of the formula:



Art Unit: 1714

which are identical to the dyes presently claimed and wherein X is OH or NR^5R^6 , $\text{R}^1\text{-R}^4$ and R^9 are hydrogen, alkyl, halogen, etc., R^7 , which corresponds to presently claimed R^{201} , is cyano, COR, etc., and R^8 , which corresponds to presently claimed R^{202} , is hydrogen, heterocyclic group, alkyl, aryl, cyano, etc. It is also disclosed that the dyes are suitable for use in inks (col.3, lines 38-67, col.4, lines 12-29, col.6, line 42-col.7, line 57, col.9, lines 12-52, col.10, lines 14-30, and col.13, lines 3-5 and 21-23). The motivation for using such dyes is that they possess high absorption and high fastness to light and heat (col.2, lines 7-10 and col.3, lines 14-21).

In light of the motivation for using specific type of oil-soluble dye disclosed by Suzuki et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Yao in order to produce an ink which possess high absorption and high fastness to light and heat, and thereby arrive at the claimed invention.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yao (U.S. 4,246,154) in view of Idei et al. (U.S. 5,302,437).

The disclosure with respect to Yao in paragraph 4 above is incorporated here by reference.

The difference between Yao and the present claimed invention is the requirement in the claims of substrate which has ink-receiving layer containing porous inorganic pigment.

Idei et al., which is drawn to ink jet recording sheet, disclose that when ink jet recording is carried out on non-coated, i.e. plain, paper, the images are low in colorfulness, clarity, printed dot density, and image density resulting in a deterioration of dot shape, feathering, and strike-through. Idei et al. also disclose that when ink jet recording is carried out on coated paper, the

colorfulness, clarity, feathering, and strike-through are improved as compared to recording on non-coated paper. The coated paper includes paper or transparent film having a silica coating (col.3, lines 15-42 and 57-66 and col.4, lines 54-57).

In light of the motivation for using coated paper as compared to plain paper disclosed by Idei et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use coated paper having a silica coating as the printing medium in Yao in order to produce a printed image which has good colorfulness and clarity as well as little feathering or strike-through, and thereby arrive at the claimed invention.

10. Claims 1-10, 12-14, and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. (U.S. 6,031,019) in view of Meyrick et al. (U.S. 6,344,497) and either JP 03231975 or JP 09059552.

Tsutsumi et al. disclose a water-based ink jet ink and method of ink jet printing wherein the ink comprises polymer particles colored with oil-soluble dye wherein the polymer includes vinyl polymer. The vinyl polymer has particle size of 5-300 nm. There is further disclosed an ink jet printing method wherein the above ink is loaded into an ink jet printer, and then printed onto coated substrate (col.1, lines 14-24, col.3, line 65-col.4, line 17, col.4, lines 21 and 49-51, col.6, lines 54-56, col.8, lines 11-12, col.11, lines 38-44 and 56-60, col.12, lines 61-67, and col.14, lines 41-43).

The difference between Tsutsumi et al. and the present claimed invention is the requirement in the claims of (a) high boiling point solvent and (b) specific type of oil-soluble dye.

With respect to difference (a), it is noted that Tsutsumi et al. disclose that the polymer and dye are added to water-insoluble solvent to form a solution or dispersion to which water is added, and then the mixture is emulsified. However, there is no explicit disclosure that the solvent is a high boiling point solvent as presently claimed. From preparation example 1, for instance, the solvent is toluene and the dye, solvent, and polymer are used in amounts of approximately 14% (1/35), 71% (5/35), and 14% (1/35), respectively.

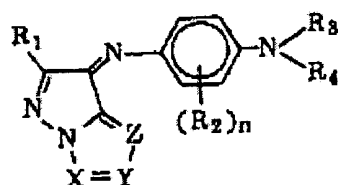
Meyrick et al., which is drawn to ink jet inks, disclose the use of water-insoluble solvent such as dibutyl phthalate. Meyrick et al. also disclose the equivalence and interchangeability of toluene, as disclosed by Tsutsumi et al., with dibutyl phthalate (col.8, lines 13 and 20). Although there is no explicit disclosure of the specific inductive capacity of the solvent, given that the solvent disclosed by Meyrick et al. is identical to those presently claimed, it is clear that the solvent inherently possesses specific inductive capacity as presently claimed.

The motivation for using such solvent is to produce ink with improved optical density and chroma (Table 2).

In light of the motivation for using specific type of solvent disclosed by Meyrick et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such solvent in the ink jet ink of Tsutsumi et al. in order to produce an ink with improved optical density and chroma, and thereby arrive at the claimed invention.

With respect to difference (b), JP 03231975, an English translation of which is included in this office action, is drawn to ink jet ink and discloses an oil-soluble dye of the formula:

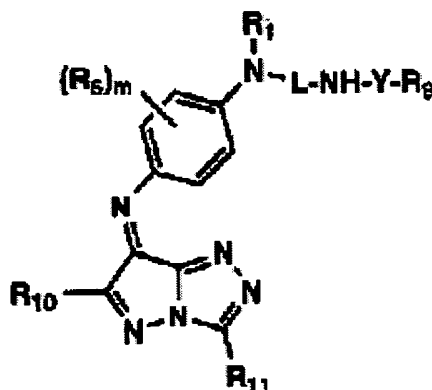
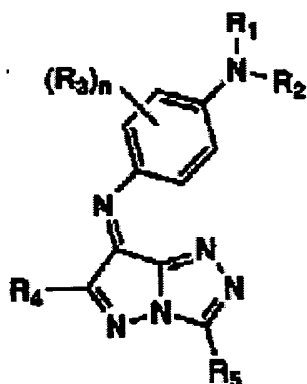
Art Unit: 1714



wherein R_3 and R_4 , which correspond to presently claimed R^4 and R^5 , are each hydrogen, alkyl, cycloalkyl, aralkyl, or aryl group, R_2 , which corresponds to presently claimed R^2 , R^3 , R^6 , and R^7 are each hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, R_1 , which corresponds to presently claimed R^1 , is hydrogen, cyano, alkyl, alkoxy, aryl, amino, or halogen, presently claimed X^1 and Y are independently either $-CR_5=$ or $-N=$, where R_5 is hydrogen or alkyl, aryl, or heterocyclic, group, and presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ wherein R^6 and R^7 are defined above (abstract, claim 1, page 7, pages 18-25). The motivation for using such dye is to produce a printed image with good hue (page 5, first full paragraph).

Alternatively, JP 09059552, an English translation of which is included in this office action, which is drawn to ink jet ink, disclose the use of oil-soluble dyes of the formula:

Art Unit: 1714



wherein R_1 and R_2 , corresponding to presently claimed R^4 and R^5 , are hydrogen, aliphatic, aromatic, or heterocyclic group, L is alkylene group, Y is carbonyl or sulfonyl group, R_9 is aromatic, aliphatic, heterocyclic, alkoxy, or amino group, R_3 or R_6 , which each correspond to either presently claimed R^2 , R^3 , R^6 , and R^7 are hydrogen, halogen, alkoxy, aryl, carboxyl, or amino group, R_4 or R_{10} , which each correspond to presently claimed R^1 , are aliphatic, aromatic, heterocyclic, alkoxy, sulfonyl, or amino group, presently claimed X^1 is $-CR_5=$ or $-CR_{11}=$, which each correspond to presently claimed $-C(R^8)=$, where R_5 or R_{11} is hydrogen, aliphatic, or aromatic group, presently claimed Y is $-N=$, and presently claimed B^1 is $=C(R^6)-$ and B^2 is $-C(R^7)=$ wherein R^6 and R^7 are defined above (abstract, claim 1, claim 3, and paragraphs 9, 16, 24-30, and 39-56). The motivation for using such dye in the ink composition is that the dye produces a printed image that has excellent color tone, reproducibility, and resistance to light (paragraph 7).

In light of the motivation for using specific type of oil-soluble dye disclosed by JP03231975 or JP 09059522, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Tsutsumi et al. in order to produce an ink with good hue,

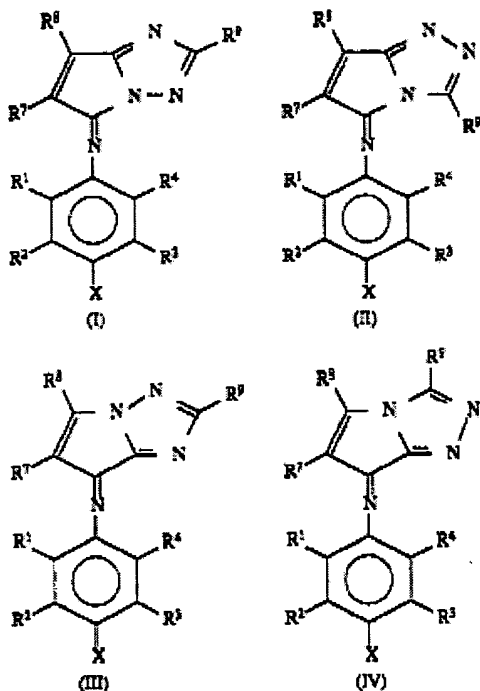
Art Unit: 1714

or alternatively, excellent color tone, reproducibility, and resistance to light, and thereby arrive at the claimed invention.

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. in view of Meyrick et al. and either JP 03231975 or JP 09059552 as applied to claims 1-10, 12-14, and 16-20 above, and further in view of Suzuki et al. (U.S. 5,508,421).

The difference between Tsutsumi et al. in view of Meyrick et al. and either JP 03231975 or JP 09059552 and the present claimed invention is the requirement in the claims of specific type of oil-soluble dye.

Suzuki et al. disclose the use of oil-soluble dyes of the formula:



which are identical to the dyes presently claimed and wherein X is OH or NR^5R^6 , $\text{R}^1\text{-R}^4$ and R^9 are hydrogen, alkyl, halogen, etc., R^7 , which corresponds to presently claimed R^{201} , is cyano, COR, etc., and R^8 , which corresponds to presently claimed R^{202} , is hydrogen, heterocyclic group, alkyl, aryl, cyano, etc.. It is also disclosed that the dyes are suitable for use in inks (col.3, lines 38-67, col.4, lines 12-29, col.6, line 42-col.7, line 57, col.9, lines 12-52, col.10, lines 14-30, and col.13, lines 3-5 and 21-23). The motivation for using such dyes is that they possess high absorption and high fastness to light and heat (col.2, lines 7-10 and col.3, lines 14-21).

In light of the motivation for using specific type of oil-soluble dye disclosed by Suzuki et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such dye in the ink jet ink of Tsutsumi et al. in order to produce an ink which possess high absorption and high fastness to light and heat, and thereby arrive at the claimed invention.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. in view of Meyrick et al. and either JP 03231975 or JP 09059552 as applied to claims 1-10, 12-14, and 16-20 above, and further in view of Idei et al. (U.S. 5,302,437).

The difference between Tsutsumi et al. in view of Meyrick et al., and either JP 03231975 or JP 09059552 and the present claimed invention is the requirement in the claims of substrate which has ink-receiving layer containing porous inorganic pigment.

Idei et al., which is drawn to ink jet recording sheet, disclose that when ink jet recording is carried out on non-coated, i.e. plain, paper, the images are low in colorfulness, clarity, printed dot density, and image density resulting in a deterioration of dot shape, feathering, and strike-through. Idei et al. also disclose that when ink jet recording is carried out on coated paper, the

Art Unit: 1714

colorfulness, clarity, feathering, and strike-through are improved as compared to recording on non-coated paper. The coated paper includes paper or transparent film having a silica coating (col.3, lines 15-42 and 57-66 and col.4, lines 54-57).

In light of the motivation for using coated paper as compared to plain paper disclosed by Idei et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use coated paper having a silica coating as the printing medium in Tsutsumi et al. in order to produce a printed image which has good colorfulness and clarity as well as little feathering or strike-through, and thereby arrive at the claimed invention.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

EP 1035172 discloses ink jet ink comprising azomethine dye and hydrophobic high boiling point solvent, however, there is no disclosure of coloring particulate as presently claimed.

Onodera et al. (U.S. 5,753,017) and JP 11349874 each disclose ink jet ink comprising dye as presently claimed and hydrophobic high boiling point solvent, however, there is no disclosure of coloring particulate as presently claimed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

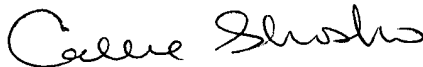
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the

Art Unit: 1714

organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho
Examiner
Art Unit 1714



Callie Shosho
6/6/02